

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



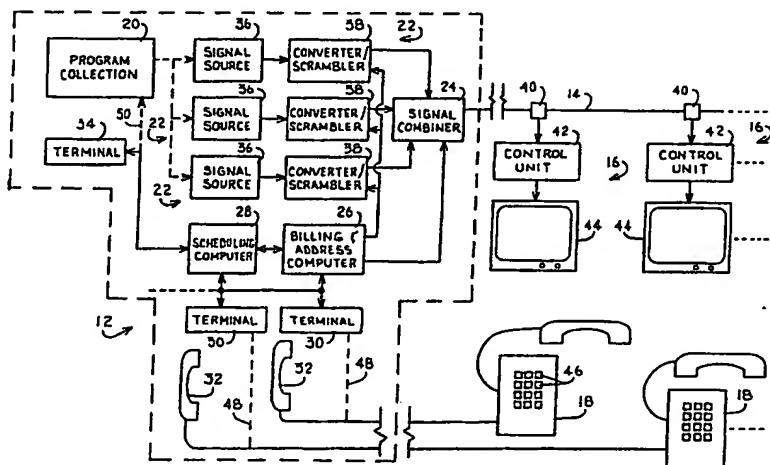
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 4 : H04N 7/167		A1	(11) International Publication Number: WO 89/12370 (43) International Publication Date: 14 December 1989 (14.12.89)
<p>(21) International Application Number: PCT/US89/02507</p> <p>(22) International Filing Date: 8 June 1989 (08.06.89)</p> <p>(30) Priority data: 204,585 9 June 1988 (09.06.88) US</p> <p>(71)(72) Applicant and Inventor: MONSLOW, H., Vincent [US/US]; 11815 Rosehill Road, Overland Park, KS 66210 (US).</p> <p>(72) Inventor: DICKEY, Steven, R. ; 2009 West 103rd Street, Leawood, KS 66206 (US).</p> <p>(74) Agent: DICKEY, Steven, R.; Hovey, Williams, Timmons & Collins, 1400 Mercantile Bank Tower, 1101 Walnut Street, Kansas City, MO 64106 (US).</p>		<p>(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent).</p> <p>Published <i>With international search report.</i></p>	

(54) Title: TELEVISION BROADCAST SYSTEM FOR SELECTIVE TRANSMISSION OF VIEWER-CHOSEN PROGRAMS AT VIEWER-REQUESTED TIMES

(57) Abstract

A television broadcast system using land lines (14) is provided for real-time transmission of a viewer-chosen program at a viewer-requested time to the requesting viewer's television receiver (16). The preferred method includes the steps of providing a collection of stored programs (20), communicating the requesting viewer's choice of a program chosen from the collection (20) and a requested time for viewing the chosen program, selecting the chosen program from a collection (20), transmitting the chosen program at the requested time for viewing on the requesting viewer's receiver (16), and preventing intelligible viewing of the chosen program on other of the receivers (44), other than that which specifically requested the program selected by viewer-associated receivers (16), and a customer service representative at telephone (18) to communicate directly with the signal combiner prepare the plurality controlled by billing and address computer.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FI	Finland	ML	Mali
AU	Australia	FR	France	MR	Mauritania
BB	Barbados	GA	Gabon	MW	Malawi
BE	Belgium	GB	United Kingdom	NL	Netherlands
BF	Burkina Fasso	HU	Hungary	NO	Norway
BG	Bulgaria	IT	Italy	RO	Romania
BJ	Benin	JP	Japan	SD	Sudan
BR	Brazil	KP	Democratic People's Republic of Korea	SE	Sweden
CF	Central African Republic	KR	Republic of Korea	SN	Senegal
CG	Congo	LI	Liechtenstein	SU	Soviet Union
CH	Switzerland	LK	Sri Lanka	TD	Chad
CM	Cameroon	LU	Luxembourg	TG	Togo
DE	Germany, Federal Republic of	MC	Monaco	US	United States of America
DK	Denmark	MG	Madagascar		

- 1 -

1

TELEVISION BROADCAST SYSTEM FOR
SELECTIVE TRANSMISSION OF VIEWER-CHOSEN
PROGRAMS AT VIEWER-REQUESTED TIMES

5

Background of the Invention

1. Field of the Invention

10

The present invention relates to a community antenna television (CATV) system. More particularly, the present invention relates to a system in which a viewer can choose a program and request a time for viewing of the chosen program on the viewer's television receiver.

15

2. Description of the Prior Art

20

With over half the homes in the United States now equipped with video cassette recorders, a major industry has developed which includes thousands of video stores for renting movies and other programs on video cassettes in order to satisfy a demand for over three billion rentals a year. One of the reasons video tape cassette rentals have become so popular is that the viewer can rent a desired program cassette from the video store's assortment and then view that program whenever desired. This is in contrast to conventional broadcast television or premium cable television in which the viewer neither chooses the program being transmitted nor the time at which it is transmitted.

25

Even with the advantages of cassette rental, certain problems are apparent. For example, the viewer must make a first round-trip to the video store to pick up the desired program cassette and then make a second round-trip to return the cassette. Additionally, the viewer may make a trip to the video store only to find that the movie is unavailable either because all of the available

- 2 -

1

copies have already been rented, or that particular video store does not stock the desired movie. If such occurs, not only is the viewer inconvenienced, but the video store also loses potential rental revenue.

5

Furthermore, the existing system for renting video cassettes presents some inherent inefficiencies. For example, in order to minimize inconvenience to the customer, the video store must be located at a premium, high rent, location such as a corner intersection or a shopping mall and pay the high rent associated with the premium location.

10

15

Second, each video store must carry a complete library of video taped programs most of which are unused at any given time. For example, it a video tape store may carry an inventory of over 5,000 program titles representing thousands more video cassettes owing to the duplication of many of the titles. The inventory problem is magnified if duplicate cassettes are stocked in VHS and BETA formats. At any given time, however, only a relatively small percentage of the titles will be rented which are typically the currently most popular programs. Even with such a large inventory, the video store can satisfy relatively few requests for the most popular programs. That is to say, even if a number of copies of a currently popular program are in stock, the demand for this program may far exceed this number of copies and potential revenue is lost while other titles lie idle.

20

25

30

35

Third, the inventory problem for video rental stores is a growing one in that new titles are released to the video market each month with the result that the number of titles in a video store's inventory grows by at least this amount each month.

- 3 -

1 The physical space required to store these additional titles may grow at an even faster rate because more than one copy of each title may be purchased. In order to handle the ever increasing number of 5 cassettes, the video store must increase its storage capacity for which it must pay a higher rent because of the store's premium location.

10 In order to solve some of the problems associated with the video cassette rental industry, various prior art solutions have been proposed. For example, Patent No. 4,506,387 which is hereby incorporated by reference discloses a system in which a cable television system (CATV) may download a recording from a central location over its cable trunk line to a memory module included in the viewer's television receiver. The program is downloaded in non-real time, typically in about 30 seconds, and the viewer then activates the memory module to view the program stored therein. The '387 patent presents some disadvantages, however, in that the central location must be equipped to download the program in non-real time. Additionally, each viewer's receiver must be equipped with a memory module to store the downloaded program. Such equipment may be prohibitively expensive and may be also inefficient in that a viewer's receiver must be properly equipped even though a particular viewer may seldom, if ever, desire to take advantage of the capability.

20 Patent No. 4,381,522 which is hereby incorporated by reference discloses a system in which a viewer can telephone the cable company's central location and electronically select a specialized recording such as a commercial advertisement for broadcast over one of the unused channels of the cable television system. A computer then 25

- 4 -

1 schedules the program, transmits it at the scheduled
time, and separately transmits a directory of all of
the scheduled programs on another unused channel.
5 The viewer then observes the directory channel to
see when the requested recording is scheduled, and
then turns to the channel indicated at the scheduled
time to view the program. The provision of the
directory channel encourages other viewers to view
one of the scheduled recordings also. The system as
10 disclosed in the '522 patent does not allow the
viewer to determine when the program is to be sche-
duled and furthermore provides no means by which
receivers other than the one of the requesting
viewer are prevented from viewing the scheduled
15 program.

Summary of the Invention

20 The present invention solves the problems
as outlined above. The invention hereof allows a
viewer to choose a program from a collection and to
view that program at a viewer-requested time on the
viewer's receiver for which the viewer is billed and
which also prevents non-requesting viewers from
intelligible viewing of the chosen program on their
associated receivers. This allows a viewer to
25 "rent" a program without the need for a VCR.

30 The present invention is advantageously
and preferably implemented in the context of a tele-
vision transmission system, typically a CATV system,
which uses land lines such as coaxial cables or
fiber optic cables for transmitting programs to a
plurality of subscriber's receivers. Preferably,
the television transmission system is an "address-
able" system in which selected programs are scram-
bled to prevent intelligible viewing thereof and in

- 5 -

1

which a descrambling signal can then be addressed to the receiver associated with the requesting viewer which in turn prompts the included control unit to descramble the program transmission for viewing on that receiver.

5

The preferred method of the present invention involves the steps of providing a collection of stored programs, selecting a program chosen from the collection for transmission at a requested time in response to a request from a viewer, transmitting the chosen program in real-time over the system's land lines at the requested time, and preventing intelligible viewing of the chosen program at the requested time by receivers other than the requesting viewer's receiver. More particularly, the preferred method includes the steps of scrambling the transmission of the chosen program and transmitting decoder signals to the requesting viewer's receiver in order to allow intelligible viewing of the chosen program thereon only by the requesting viewer and thereby preventing intelligible viewing by others.

10

15

Additionally, the preferred method also includes the steps of transmitting the chosen program at the requested time over a selected channel and communicating the identity of the selected channel only to the requesting viewer.

20

25

In preferred forms, the method hereof includes the steps of transmitting address signals specific to the control unit associated with the requesting viewer and transmitting associated descrambler signals specific to the selected channel over which the chosen program is being transmitted.

Advantageously, the preferred method includes the steps of identifying a section of the

- 6 -

1 land lines having a subset of receivers operably
5 coupled thereto, transmitting the chosen program
over the section of the land lines, identifying a
juncture between the section and the remaining
portion of the land lines, and preventing transmis-
sion of the chosen program therebeyond by use of a
blocking device located at the juncture.

10 The preferred apparatus includes a collec-
tion of stored programs, means for selectively
choosing certain ones of the programs for transmis-
sion, means for transmitting a chosen program at a
requested time, and a scheduling computer for sche-
duling program choices and requested times. The
15 preferred apparatus also includes computer means for
receiving information from the requesting viewer as
encoded signals preferably over telephone lines
using telephone touch-tones. In especially prefer-
red forms, the computer means is equipped for voice
communication with the requesting viewer either in
20 the form of synthetically generated voice signals or
prerecorded selected messages.

Other preferred aspects of the present
invention are explained hereinbelow.

Brief Description of the Drawing Figures

25 Figure 1 is schematic illustration of the
preferred configuration of the present invention;

Fig. 2 is a schematic illustration showing
the preferred interconnection between the configura-
30 tion of Fig. 1 and sections of the transmission
system.

Detailed Description of the Preferred Embodiments

The present invention is preferably imple-
mented in the context of a conventional community

- 7 -

1 antenna television (CATV) system, the equipment and
operation of which are well understood by those
skilled in the art and which are explained in part
in the Electronics Engineer's Handbook, Second
5 Edition, which is hereby incorporated by reference.

10 Preferred system 10 (Figs. 1) includes
central unit 12, land lines 14, a plurality of
viewer-associated receivers 16, and a plurality of
viewer-associated telephone handsets 18.

15 Central unit 12 includes program collec-
tion 20, a plurality of signal transmitters 22,
signal combiner 24, billing and address computer 26,
scheduling computer 28, a plurality of input data
computer terminals 30 having associated telephone
units 32, and output schedule computer terminal 34.

20 Program collection 20 includes a plurality
of programs stored on a medium allowing selective
reproduction and real-time transmission thereof over
land lines 14 for reception by and viewing on re-
ceiver 16 by an associated viewer. Preferably, the
programs stored in collection 20 are stored on 3/4"
video tape which allows for higher fidelity repro-
duction than conventional 1/2" video tape. Each
program is preferably assigned and labeled with a
catalog number, a list of which is stored in sche-
duling computer 28. Preferably, up to three copies
25 of selected programs are included in collection 20
which to allow continuous transmission of ninety-
minute programs at half-hour intervals if desired
for currently popular programs.

30 As those skilled in the art will appreci-
ate, the programs in collection 20 can be stored on
a variety of media including compact disks, floppy
disks, hard disks, conventional magnetic tape, elec-
tronic memory such as that disclosed in U.S. Patent

- 8 -

1 No. 4,506,387, or the like. While storage on video
tape is preferred, available technology and economic
factors may dictate an alternative storage medium.

5 Signal transmitters 22 are conventional
units commonly found in the "head end" of a typical
CATV system. Signal transmitter 22 includes signal
source 36 and converter/scrambler unit 38.

10 Signal source 36 in a typical CATV system
is the origination point for signals received by way
of antenna, microwave, land lines from a local
television station, or a video cassette recorder
(VCR). Preferred signal source 36 includes a 3/4"
video cassette recorder (VCR) operable to receive
and play video cassettes selected from collection 20
15 and to produce signals representative thereof for
presentation to converter/scrambler unit 38.

20 Conventional converter/scrambler unit 38
receives signals from signal source 36 and converts
those signals for output on a predetermined fre-
quency channel. In a conventional system, these
channels include low band, mid-band, high band,
super band, and hyper band, which, depending upon
the design of the system, may allow selection of up
to seventy different channels for program trans-
mission on a single coaxial cable trunk line. In
25 the preferred system, unit 38 is operable to selec-
tively scramble program transmissions.

30 Conventional signal combiner 24 receives
the output signals from transmitters 22 on the
various channels and combines those signals for
transmission over land lines 14. Signal combiner 24
is also typically coupled with conventional billing
and address computer 26.

35 Computer 26 is operable to transmit decod-
er signals by way of signal combiner 24 onto land

- 9 -

1 lines 14 and thereby to receivers 16 which allows
5 intelligible viewing of scrambled program transmis-
10 sion on selected ones of receivers 16 and prevents
15 intelligible viewing on others. That is to say,
20 computer 16 keeps track of which viewers which have
25 subscribed to certain premium channels such HBO, and
30 periodically transmits decoder signals which include
35 address signals specific to receivers 16. Descram-
40 bling signals are typically associated with the
45 address signals which prompts the addressed receiver
50 16 to descramble the transmissions identified by the
55 associated descrambler signals. Receivers 16 which
60 do not receive descrambling signals associated with
65 their respective address signals prevent intelli-
70 gible viewing of the scrambled program transmission.

Computer 26 is also operable for producing
billing information as appropriate for the services
to which the individual viewers have subscribed. As
those skilled in the art will appreciate, the vari-
ous functions performed by computer 26 may be per-
formed by separate computers.

Scheduling computer 28 is preferably a
minicomputer and is operably coupled with terminals
30, with computer 26, and with terminal 34. As will
be explained further hereinbelow, computer 28 re-
ceives data representative of the program choices
and requested times for viewing thereof and presents
outputs at terminal 34 whereby the chosen program
can be selected from collection 20 for transmission
by the respective signal transmitter 22 at the
requested time.

In one embodiment, viewers communicate
their program choices and requested viewing times by
way of conventional telephone handsets 18 connected
through the local telephone network. Respective

- 10 -

1

customer service representatives answer the incoming calls over phone units 32 and then enter the information communicated from the viewers into scheduling computer 28 by way of respective terminals 30, each of which includes a conventional data entry keyboard and monitor.

5

Land lines 14 typically include coaxial cables which transmit the programs from program unit 12 to receivers 16. Receivers 16 are conventionally coupled with land lines 14 by way of respective cable taps 40.

10

Receivers 16 each include control unit 42 and television 44. Control unit 42 converts a program transmission received from land lines 14 on one of the various transmission channels to an output on a preselected channel for reception by television 24.

15

Control unit 42 is also operable to selectively descramble certain of the transmissions received by way of land lines 14 from central unit 12. Each control unit 42 is equipped to receive decoder signals to detect its specific address signal from computer 26 and in response to descramble the transmission identified by the descrambling signals associated with the address signals.

20

In the preferred method of operating system 10, each subscribing household is provided with a catalog of the programs included in collection 20 along with the associated program identification number by which scheduling computer 28 identifies the program and by which they are labeled and stored in collection 20. Preferably, monthly supplements to the program catalog are provided as new programs are added to collection 20 and new catalogs are periodically issued incorporating the previous

30

35

- 11 -

1 supplements as needed. The program listings in the
catalog are preferably arranged alphabetically and
also by subject category to facilitate selection of
a desired type of program. Collection 20 includes
5 full-length movies, recordings of previously trans-
mitted regularly scheduled commercial broadcasts and
other programs of interest to the subscribers. Each
subscribing household is preferably provided with a
confidential identification number in order to prevent
10 unauthorized ordering and thereby billing of a
program.

15 After a viewer has chosen a program, the
viewer then uses telephone handset 18 to place a
telephone call over the conventional telephone
network to the telephone number associated with
central unit 12. Customer service representatives
answer the incoming telephone calls to whom the
viewer communicates the program choice and requested
time along with the viewer's name and confidential
identification number. The customer service repre-
20 sentative then enters this information by way of
terminal 30 into computer 28.

25 In accordance with conventional computer
programming techniques well known to those skilled
in the art, computer 28 first determines whether the
viewer's name and identification number match. If
not, this fact is communicated to the representative
who informs the viewer that the request cannot be
satisfied without a correct match. If the customer
name and identification number do match, computer 28
30 then determines whether the chosen program has been
already previously scheduled at the requested time.
If such is the case, computer 28 need not reschedule
the chosen program, but rather needs only prompt
address computer 26 to transmit proper decoding

- 12 -

1 signals to the viewer's control unit 16 at the
requested time to allow the viewer's receiver to
descramble the program and to enter the billing
information.

5 If the chosen movie has not been previous-
ly scheduled at the requested time, computer 28
determines whether a channel is available at the
requested time. If yes, computer 28 selects an
available channel and schedules this channel for
10 transmission of the chosen program at the requested
time. Computer 28 then presents confirmation of
this to the customer service representative on the
monitor associated with terminal 30 along with the
channel number which is then communicated to the
15 viewer.

15 Computer 28 provides scheduling informa-
tion as output by way of terminal 34. In the pre-
ferred form, an operator reads the output from
terminal 34 either presented on an associated moni-
tor or as a hard copy print out. In response, the
operator selects the chosen program from collection
20 20 and inserts into the appropriate VCR included in
signal source 36 which is associated with the sche-
duled channel. That is to say, each transmitter 22
is associated with a specific output channel and the
25 information provided from computer 28 by way of
terminal 34 instructs the operator which VCR is to
be used for transmitting the chosen program at the
requested time. In the alternative, system 10 could
be arranged such that any unused signal transmitter
30 22 can be selected and then adjusted to transmit on
the scheduled channel. At the requested time the
operator activates the appropriate VCR in order to
transmit the program which is scrambled and convert-

- 13 -

1 ed by unit 38 and presented on the selected channel
to signal combiner 24 and onto land lines 14.

5 Computer 28, upon scheduling the chosen
program at the requested time, also interacts with
computer 26 so that computer 26 sends appropriate
decoder signals at the requested time and during
transmission of the program to receiver 16 associ-
ated with the requesting viewer. The decoder sig-
nals include address signals specific to control
10 unit 16 associated with the requesting viewer and
prompts control unit 42 to descramble the chosen
program in accordance with the descrambler signals
associated with the address signal. In this way,
the requesting viewer can view the program on the
15 viewer-associated television 44. By scrambling the
transmission, and by not providing a descrambling
signal to other receivers, subscribers other than
the requesting viewer are prevented from intelli-
gible viewing of the chosen program.

20 Upon transmission of the chosen program at
the requested time, billing and address computer 26
is programmed to automatically add the specified
program charge to the requesting viewer's monthly
bill.

25 If there are no available channels at the
requested time, computer 28 is preferably programmed
to determine the nearest available time frame during
which a channel is available or to determine the
nearest available time when the chosen program is
already scheduled for transmission. This informa-
30 tion is then presented to the customer service
representative on terminal 30 who in turn communi-
cates this information to the requesting viewer who
may thereupon select one of the alternative times.
For example, if the requesting viewer wishes to see

- 14 -

1 a very popular program at a certain time, and all of
the channels are already scheduled for that time,
none of which include that chosen program, an unused
5 channel may be available shortly before or after the
requested time or the chosen program may be already
be rescheduled at a nearby time whereupon the re-
questing viewer can select one of these.

10 As discussed above, scheduling computer 28
is programmed to ensure that the viewer's identifi-
cation number matches the name of the requesting
viewer, or the requesting viewer's address, and so
forth. As a further check, computer 28 can be pro-
grammed to also include the requesting viewer's
15 telephone number, and upon being provided with this
information, can double check this against the
confidential identification number and the request-
ing viewer's name and address. This provides addi-
tional assurance that unauthorized persons do not
schedule programs which would be billed against
20 another subscriber's account.

25 As those skilled in the art will appreci-
ate, the requirement for a customer service repre-
sentative to answer telephone 32 can be eliminated
by the provision of a so-called "auto-dial" device
which would allow the requesting viewer to communi-
cate directly with scheduling computer 28 by provid-
ing appropriate encoded signals such as those pro-
vided by buttons 46 as touch-tone signals from
telephone handset 18. Such systems are well known
30 to those skilled in the art and are commonly used in
banking services whereby customers can conduct
transactions with their financial accounts. Such
systems often include voice response systems which
can be incorporated in computer 28 to provide verbal
messages by way of synthesized voice or prerecorded

- 15 -

1 verbal messages. The requesting viewer can respond
5 to inquiries by the computer by entering the appropriate codes on push buttons 46. Such an interconnection with computer 28 by way of terminal 30 is indicated by the dashed lines 48.

10 Those skilled in the art will also appreciate that the information from the requesting viewer can be communicated to central unit 12 by using land lines 14 such as with an interactive cable system. Such systems are well known such as those described in U.S. Patent Nos 4,290,142, 4,408,345, and 4,710,955 which are hereby incorporated by reference.

15 As discussed above in connection with U.S. Patent No. 4,506,387, program collection 20 can include programs stored in electronic memory. If such is preferred, computer 28 can be connected directly with collection 20 as represented by line 50. In addition, collection 20 can be directly coupled with signal sources 36 as illustrated by lines 52. With such an arrangement, the requirement for an operator to physically select the programs from collection 20 and in to insert them in the appropriate VCR is eliminated. That is to say, upon instructions from scheduling computer 28, collection 20 is operable to cause the chosen program to be transmitted directly to the appropriate signal source 36 for the scheduled channel at the requested time.

30 While the present invention is discussed in the environment of a conventional CATV system using coaxial cables such as land lines 14, the present invention is also useful in the context wherein land lines 14 are fiber optic cables or telephone lines. Fiber optic cables have the capa-

- 16 -

1 bility of carrying many more channels than a coaxial
 cable with repeaters spaced further apart and with
 somewhat greater immunity to external noise. In
 such a system, conventional telephone communication
5 may also be provided over such a fiber optic cable
 or, in the alternative, a separate key pad, key-
 board, or the like can be included as part of re-
 ceiver 16 whereby the requesting viewer can enter
10 data representative of the chosen program and
 requested time for transmission over the land lines
 14 directly to computer 28.

15 A typical cable television system using a
 coaxial cable as a trunk line may have upwards of
 fifty channels unused for regularly scheduled trans-
 missions. With the potential for a thousands of
 receivers connected to the system, fifty unused
 channels may not be adequate to supply the demand
 viewer-chosen program viewing. It should be appre-
 ciated, however, that in this example, fifty avail-
20 able channels can still satisfy the program choice
 demands of many thousands of subscribers. For
 example, fifty channels transmitting the fifty most
 popular programs of the day may satisfy up to 80% of
 the program requests. It would not be unexpected
 that many subscribers may request the most popular
25 program. This, coupled with the fact that all of
 the subscribers will not likely be requesting movies
 at the same time, may allow fifty available channels
 to serve many subscribers.

30 Nevertheless, there may be some upper
 limit as to the number of subscribers that the
 available channels can adequately serve. In order
 to provide the optimum service to the subscribers in
 a system, the present invention encompasses the
 configuration as illustrated in Fig. 2. A typical

- 17 -

1 CATV system includes a head end 52 at which the
transmitted program originates and which in turn
transmits the programs on the various channels by
way of land lines 14. In the preferred embodiment
5 as illustrated in Fig. 2, land lines 14 are further
designated to include a plurality of sections of
which sections 54 and 56 are illustrated. Each sec-
tion 54, 56 includes a respective subset 58 and 60
of receivers respectively coupled thereto. Each
10 section 54, 56 and so forth is respectively coupled
to the remaining portions of land lines 14 at a
respective node or juncture 62, 64.

15 In the preferred embodiment of the present
invention, a central unit is provided for each
subsection. Two such central units 12 and 66 are
illustrated and are respectively coupled via lines
68 and 70 with respective sections 54 and 56.
Furthermore, respective blocking devices 72 and 74
are provided at junctures 62 and 64 respectively.

20 Blocking devices 72 and 74 are preferably
low pass filters which allow transmissions from head
end 52 transmitted at the lower frequency channels
to pass unimpeded therethrough. Viewer-chosen
programming is preferably transmitted at the higher
frequency channels directly to the respective sec-
tions 54, 56. Blocking devices 72 and 74 prevent
25 transmission of these higher frequency channels
beyond their respective sections so that they do not
interfere with one another. That is to say, each
program unit 12 and 66 can broadcast viewer-chosen
programs on the same channel frequencies but the
sections are isolated from one another by the block-
ing devices.

30 Sections of land lines 14 can be identi-
fied and designated as desired by the proper place-

- 18 -

1 ment of a blocking device such that each program
5 unit can adequately serve the program requests of
the viewers associated with the subset of receivers
10 included in each subsection. For example, if a CATV
system has 50,000 subscribers, and it is determined
that fifty channels can adequately satisfy the
15 viewer-chosen program requests of 10,000 viewers,
five sections of 10,000 receivers each would be
designated with a blocking device installed at the
juncture between each designated section and the
remaining portions of the land lines. In this way,
transmissions produced by separate central units on
the same channels to separate sections would not
interfere with one another. This arrangement effec-
tively multiplies the number of available channels
15 for viewer-chosen programs.

20 As preferred, central units 12, 66 and so
forth, are located in physical proximity with head
end 52 to take advantage of already existing equip-
ment. It should be appreciated, however, that even
25 with multiple central units, multiple scheduling
computers, billing, and address computers may not be
needed. That is to say, a single set of appropri-
ately selected computers can serve all of the cen-
tral units. Additionally, economy of a scale may
dictate that all of the central units use a common
30 program collection 20 in order to minimize the size
of the inventory. Furthermore, the various program
units may also share a common set of incoming tele-
phone lines for communicating with requesting view-
ers.

35 As an alternative, however, and depending
upon the configuration of the CATV network and the
economics involved, it may be desirable to locate a
totally independent and free-standing program unit

- 19 -

1

physically adjacent its associated section of the land lines or physically adjacent another location such as the central administrative office of the CATV transmission system. That is to say, those skilled in the art will appreciate that the physical location of the program unit and whether multiple program units can use common equipment is a matter of design choice dictated by technology, economics, and so forth.

10

Those skilled in the art will also appreciate that blocking devices 62, 64, and so forth may include distribution repeaters or amplifiers which are designed to amplify the frequency channels emanating from head end, but by their nature inherently block passage of the higher frequency channels from the various sections to the remaining portions of land lines 14. This can be implemented by coupling line 68, immediately "downstream" of the repeater nearest juncture 62. Other repeaters downstream of this blocking repeater receive and amplify all the incoming transmissions including the transmissions from the head end and those injected at juncture 62.

15

As should now be apparent from the description above, the present invention allows a requesting viewer to choose a program for viewing at a requested time on the television receiver associated with the requesting viewer. The convenience provided thereby eliminates the need for the viewer to drive to a video store to pickup a chosen movie on video tape and to again repeat the trip to return the movie.

20

Additionally, the present invention minimizes the risk that the viewer will be unable to view the chosen program at the viewer requested

- 20 -

1 time. This risk is minimized for two reasons. First, the preferred embodiment hereof designates
5 sections of the land lines which are matched from a capacity standpoint with its associated program unit in order to satisfy the demands of the viewers associated therewith. Secondly, the present invention allows as many viewers as are connected to the system to choose the same program at the same time. This is because once the chosen program is scheduled
10 for transmission on a particular channel, additional viewers can be added simply by transmitting the appropriate descrambling signals to the requesting viewer's receiver. In this way, many viewers can choose the currently most popular program rather than just a few as determined by the number of
15 cassette copies available as with prior art video stores.

20 The present invention also avoids the need for premium rental space in which to store a large inventory of programs and eliminates the many duplications of inventory carried by the many video stores in a territory.

25 Having thus described the preferred embodiments of the present invention, the following is claimed as new and desired to be secured by Letters Patent:

- 21 -

1

Claims

5

10

1. A method of operating a television transmission system using land lines for transmitting television programs for reception by a plurality of receivers coupled with land lines for viewing the programs on the receivers by viewers respectively associated therewith, the system including means for selectively preventing intelligible viewing of certain programs by certain receivers, said method comprising the steps of:

15

providing a collection of stored programs stored on a medium allowing selective reproduction and real-time transmission of said stored programs over the land lines; selecting a prospective chosen program from said collection for transmission at a requested time in response to a request therefor from a requesting viewer;

20

transmitting said chosen program in real-time over the land lines at said requested time for reception by and viewing on a receiver associated with said requesting viewer; and

25

preventing intelligible viewing of said chosen program at said requested time on receivers other than said receiver associated with said requesting viewer.

30

35

- 22 -

1

2. The method as set forth in claim 1,
the system including --

5

scrambler means operably coupled with said land
lines for selectively scrambling the
transmission of certain of the program
transmissions in order to prevent intelligible
viewing thereof on the receivers,
a plurality of control units respectively
corresponding to and operably associated
with the receivers and operably coupled
with the land lines, each control unit
being operable for receiving decoder
signals and in response thereto for selectively
descrambling certain ones of the
program transmissions for allowing intelligible
viewing thereof on the associated
receiver; and

10

decoder signal means operably coupled with the
land lines and operable for selectively
transmitting decoder signals for reception
by the receivers in order to allow intelligible
viewing of certain ones of the programs
on selected ones of the receivers, said method further including the
steps of --

15

scrambling the transmission of said chosen
program in order to prevent intelligible
viewing thereof on the receivers, and
transmitting decoder signals for receipt by
said receiver associated with said requesting
viewer in order to allow intelligible
viewing of said chosen program
thereon.

20

25

30

35

- 23 -

1

3. The method as set forth in claim 1,
the system including means for simultaneously trans-
mitting a plurality of programs on a respective
plurality of identifiable channels, the receivers
being operable for tuning to a selected channel,
said method further including the steps of --

5

transmitting said chosen program during said
requested time over a selected channel,
and
10 communicating the identity of said selected
channel only to said requesting viewer.

10

15

20

25

30

35

- 24 -

1

4. The method as set forth in claim 2,
the system including means for transmitting a plu-
rality of programs on a respective plurality of
identifiable channels, the control units being oper-
able for tuning to a selected channel, the decoder
signals including address signals respectively
specific to the control units and descrambler sig-
nals respectively associated with the address sig-
nals and respectively specific to identify selected
transmissions each control unit being responsive to
specific address signals and the descrambler signals
associated therewith for descrambling program trans-
missions on the channels identified by the descram-
bler signals, said method further including the
steps of --

5

selecting a channel for transmission,
transmitting said chosen program during said
requested time on said selected channel,
communicating the identity of said selected
channel only to said requesting viewer,
transmitting address signals specific to the
control unit associated with the request-
ing viewer's receiver and transmitting
associated descrambler signals specific to
identify said selected channel.

10

15

20

25

30

35

- 25 -

1

5. The method as set forth in claim 1,
further including the steps of --

5

identifying a section of the land lines having
a subset of receivers operably coupled
thereto wherein said subset includes a
plurality of receivers less than the total
number of receivers included in the sys-
tem, and remaining portions of the land
lines having a plurality of receivers
other than said subset coupled thereto,
transmitting said chosen program over said
section of the land lines,
identifying a juncture between said section and
said remaining portion, and
10 preventing transmission of said chosen program
beyond the juncture from said section to
said remaining portion by use of a block-
ing device located at said juncture.

15

20

6. The method as set forth in claim 1,
further including the steps of --

25

30

providing computer means operable for receiving
from said requesting viewer encoded sig-
nals representative of said chosen pro-
gram, said requested time, and the iden-
tity of said receiver associated with said
requesting viewer,
said selecting step including the step of
selecting said chosen program from said
collection in response to said encoded
signals from said requesting viewer.

7. The method as set forth in claim 1,
said encoded signals including telephone touch-tone
signals.

- 26 -

1

8. The method as set forth in claim 6, further including the step of providing said computer means with voice interaction capability and using said computer for providing voice communication to said requesting viewer.

5

10

9. The method as set forth in claim 1, further including the steps of providing scheduling computer means operable for scheduling multiple program choices and multiple requested times.

15

10. The method as set forth in claim 9, further including the steps of --

providing computer means for providing billing information correlated with the requesting viewer's chosen program, and providing a bill to said requesting viewer corresponding to said chosen program.

20

11. The method as set forth in claim 1, further including the step of providing electronic memory means having said collection stored therein.

25

12. The method as set forth in claim 1, the land lines including coaxial cables.

13. The method as set forth in claim 1, the land lines including fiber optic cables.

30

35

- 27 -

1 14. In a television transmission system
using land lines for transmitting programs for
reception by a plurality of television receivers
coupled with the land lines for viewing of the
5 programs on the receivers by viewers respectively
associated therewith, and including communicating
means for communicating information as encoded
signals over the land lines from said viewers, the
improvement comprising:

10 a collection of stored programs stored on a
medium allowing selective reproduction and
real-time transmission over the land lines
for reception and viewing thereof by
selected receivers;

15 computer means operably coupled with the com-
municating means for receiving encoded
signals from a requesting viewer, said
encoded signals being representative of a
requesting viewer's choice of a program
chosen from said collection and said
requesting viewer's requested time for
viewing of said chosen program on a re-
ceiver associated with said requesting
viewer and for providing output informa-
tion representative thereof;

20 selecting means operably associated with said
collection and said computer means and
responsive to said output information for
selecting said chosen program from said
collection; and

25 transmitting means operably associated with and
responsive to said selecting means for
transmitting said chosen program over the
land lines at said requested time for
reception by and viewing on said request-
ing viewer's receiver.

- 28 -

1

15. The apparatus as set forth in claim
14, the communicating means including telephone
lines, the encoded signals including touch-tone
signals, said computer means including means for
providing voice communication to said requesting
viewer over the telephone lines.

5

10

16. The apparatus as set forth in claim
15, the system including means for transmitting
programs on a respective plurality of channels,

15

said computer means including means for sche-
duling one of the channels for transmis-
sion of said chosen program thereon and
including means for providing voice com-
munication over the telephone lines iden-
tifying the channel on which said chosen
program is to be transmitted to the re-
questing viewer.

20

25

30

35

- 29 -

1

17. In a television transmission system using land lines for transmitting programs for reception by a plurality of television receivers coupled with land lines for viewing of the programs on the receivers by viewers respectively associated therewith, the system further including communicating means for receiving information over land lines from the viewers, the land lines including a section thereof having a subset of the receivers coupled therewith wherein said subset includes a plurality of receivers less than the total number of receivers included in the system, the remaining portion of the land lines having a plurality of receivers other than the subset coupled therewith, the section and the remaining portion being coupled with one another at a juncture, the improvement comprising:

20

a collection of stored programs stored on a medium allowing selective reproduction and real-time transmission thereof over the land lines for reception and viewing thereof by selected receivers;

25

receiving means operably associated with the communicating means for receiving information from a requesting viewer, said information including a requesting viewer's choice of a program chosen from said collection and a requested time for viewing of said program on a receiver associated with said requesting viewer, said associated receiver being included in the subset of receivers;

30

selecting means operably associated with said collection and operably associated with and responsive to said receiving means for

- 30 -

1 selecting said chosen program from said collection;

5 transmitting means operably associated with said selecting means and coupled with the subsection of the land lines for transmission of said chosen program at said requested time for reception by and viewing one on said associated receivers; and

10 blocking means located in the vicinity of the juncture for preventing transmission of the chosen program therebeyond from the section into the remaining portions of the land lines.

15 18. The apparatus as set forth in claim 17, the system including means for simultaneously transmitting selected programs over a respective plurality of channels included in a specified group of channels,

20 said transmitting means including means for transmitting said chosen program on a selected channel other than the channel included in said selected group of channels,

25 said blocking means including structure allowing passage of programs being transmitted on the channels included in the selected group and structure for preventing passage of transmissions on said selected channel from the section to the remaining portion of the system.

30

- 31 -

1

19. The apparatus as set forth in claim 18, said selected channel being at a relatively higher frequency than the channels in the specified group.

5

10

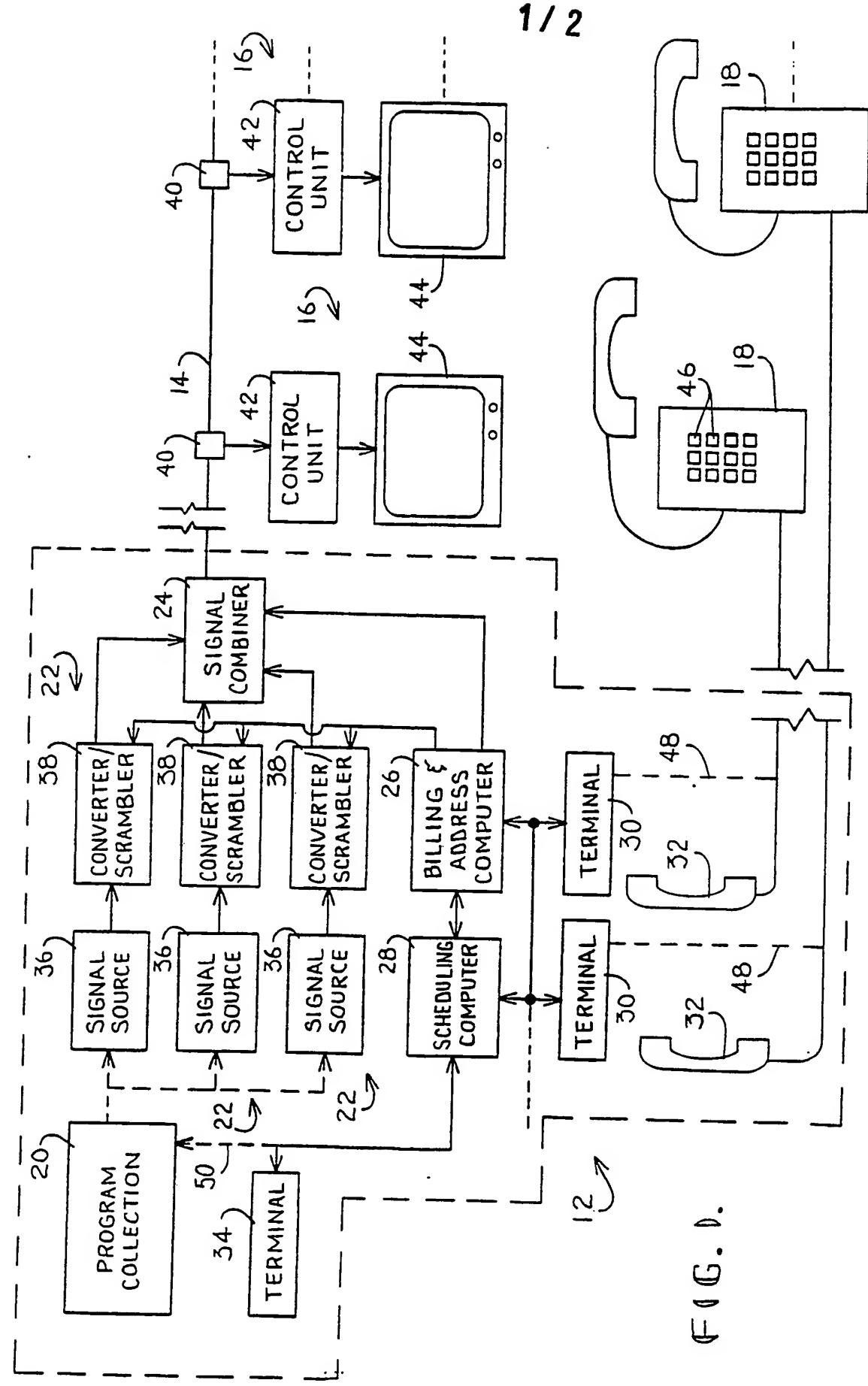
15

20

25

30

35



2 / 2

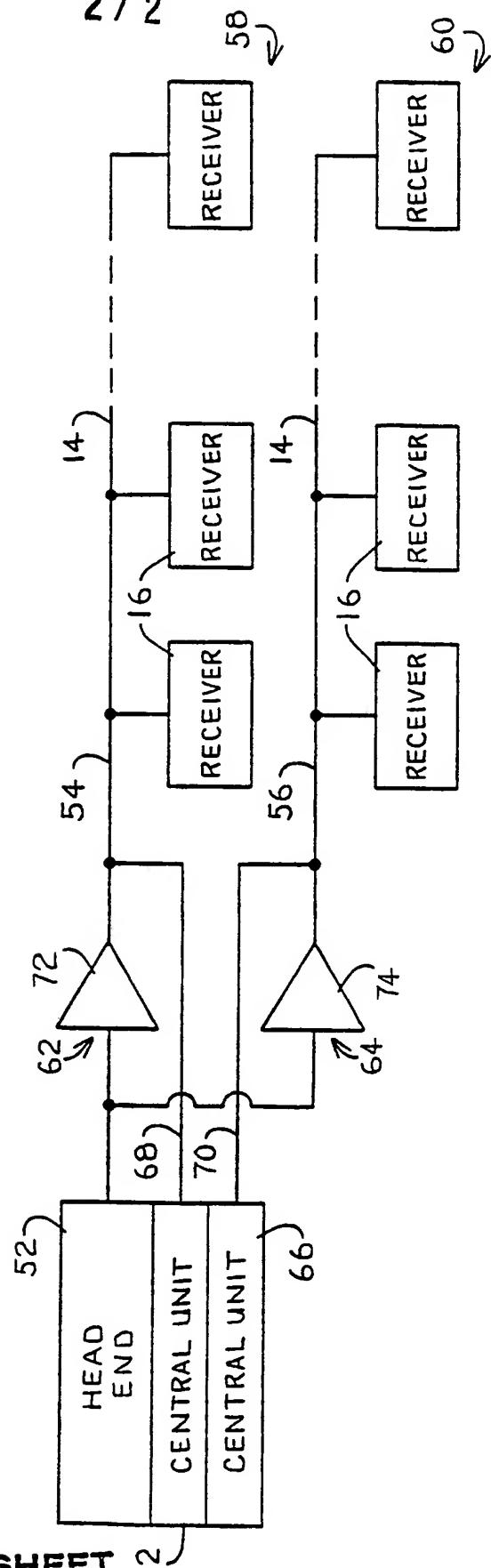


FIG. 2.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US89/02507

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³

According to International Patent Classification (IPC) or to both National Classification and IPC

INT. CL. ⁴ H04N 7/167

U.S. CL. 380/10

II. FIELDS SEARCHED

Classification System	Minimum Documentation Searched ⁴	
		Classification Symbols
U.S.	358/85,86	
	380/3,5,7,10	
	455/3,4,5,6	
		Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵

III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴

Category ⁶	Citation of Document, ¹⁴ with indication, where appropriate, of the relevant passages ¹⁴	Relevant to Claim No. ¹⁴
A	US, A, 4,251,691 Published 17 February 1981, Kakihara et al.	1,14,17
Y	US, A, 4,381,522 Published 26 April 1983, Lambert, abstract.	1-19
A	US, A, 4,710,955 Published 01 December 1987, Kauffman.	1,14,17
A,P	US, A, 4,761,684 Published 02 August 1988, Clark et al.	1,14,17
Y,P	US, A, 4,763,191 Published 09 August 1988, Gordan et al., abstract.	1-19
A,P	US, A, 4,785,472 Published 15 November 1988, Shapiro.	1,14,17

* Special categories of cited documents: ¹⁵

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"S" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search:

08 August 1989

Date of Mailing of this International Search Report ⁷

06 SEP 1989

International Searching Authority ⁸

ISA/US

Signature of Authorized Officer ⁹

Bernarr Earl Gregory
Bernarr Earl Gregory

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category	Citation of Document, ^{if} with indication, where appropriate, of the relevant passages ^{if}	Relevant to Claim No ^{to}
Y, P	US, A, 4,792,849 Published 20 December 1988, Mc Calley et al., abstract.	I-19